

# **MATTER**

## **TARGETED NH FRAMEWORKS FOR SCIENCE LITERACY**

S:PS1:6:1.1 Recognize that all matter is composed of minute particles called atoms; and explain that all substances are composed of atoms that can be arranged into different groupings.

S:PS1:8:1.6 Collect data or use data provided to infer or predict that the total amount of mass in a closed system stays the same, regardless of how substances interact (conservation of matter).

S:PS1:8:2.1 Differentiate between volume and mass and define density.

**S:PS1:8:2.4 Investigate the relationships among mass, volume and density. [PS1(5-8)INQ-1]**

**S:PS1:8:2.6 Represent or explain the relationship between or among energy, molecular motion, temperature, and states of matter. [PS1(5-8)SAE+MAS-4]**

S:PS2:6:1.1 Differentiate between a physical change, such as melting, and a chemical change, such as rusting.

## **CHILD-FRIENDLY ESSENTIAL STANDARD(S)**

*I can explain that atoms are tiny particles that make up all substances and can be combined to make new substances*

*I can explain how matter is conserved even when it changes form*

***I can explain the difference between mass and volume. I can explain the relationship between mass and volume and how the two together express density.***

***I can explain how temperature and the state of matter depend on the energy level of atoms or molecules.***

*I can interpret indicators of physical and chemical changes, when substances are combined, and evaluate whether or not something new is created.*

### **PRIOR KNOWLEDGE (Presented in previous grade levels)**

Grade 3 study of matter includes:

- Exposure to following vocab: gas, liquid, solid, mass (as a noun), matter, molecule as a small part of matter, properties, states of matter, water vapor, melt, freeze, sublimate, evaporation, condensation
- Students should understand that mass takes up space
- Students have explored the differences between solids, liquids, and gasses
- They have been exposed to molecular movement and how it differs in solids, liquids, and gasses
- Explore conservation of mass using a bag of melting ice

Grade 5 includes the following concepts:

- introduction to word “electron”
- introduction of the following vocabulary re: properties of matter: malleability, states of matter,

### **ESSENTIAL UNDERSTANDING(S)**

All living and nonliving things are composed of matter (particles) having characteristic properties that distinguish one substance from another.

### **CONTENT/SKILLS DEVELOPED IN GRADE 6**

- 1) Students will define matter and know that all matter is composed of minute particles called atoms.
- 2) Students will demonstrate how energy levels (heat) change the way particles move and that drives the state of matter of a substance (Tom Snyder’s “Particles in Motion”)
- 3) Students will differentiate between mass and weight
- 4) Students will classify objects by their observable properties with focus on mass, weight, volume, density – see vocab list for additional properties to be “introduced”
- 5) Students will develop a conceptual understanding of density as a relationship between a substance’s mass and volume
- 6) Students will be able to demonstrate the concept of “conservation of matter”
- 7) Students will explain the difference between a chemical and physical change in matter and recognize the indicators of a chemical change.

## **VOCABULARY**

### **Prior Knowledge**

None

### **Introduced**

Chemical change

Physical change

Particles

Solubility

Malleability (intro in 5<sup>th</sup>)

Boiling and melting points

Ductility

### **Mastered**

Mass

Volume

Density

Weight

Atoms

Molecules

Observable properties (To be listed out)

States of matter (solid, liquid, gas)

Conservation of Matter